



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/863,652	05/22/2001	Eng-Chew Cheah	9818-050-999	1049

24341 7590 01/29/2003

Pennie & Edmonds, LLP  
3300 Hillview Avenue  
Palo Alto, CA 94304

EXAMINER

ZARNEKE, DAVID A

ART UNIT

PAPER NUMBER

2827

DATE MAILED: 01/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/863,652	<b>Applicant(s)</b> CHEAH, ENG-CHEW	
	<b>Examiner</b> David A. Zarneke	<b>Art Unit</b> 2827	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 December 2002.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 and 20-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 20-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All   b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892).                            | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Response to Arguments*

Applicant's arguments filed 12/11/02 have been fully considered but they are not persuasive.

It is argued that Tanaka fails to teach the bond wire being attached to the support body, and even teaches, in one embodiment, that the support body is retracted after wire bonding is complete.

The examiner asserts that while in fact one embodiment does teach retracting the support body (15), in other embodiments, the support body is left in direct contact with the bond wire.

In the specification on page 2, line 46 and page 10, line 36+ both state unequivocally, that the wiring support portion comes in direct contact with the bond wires (Figure 8).

The portion of the specification noted in the amendment referring to the retracting of the support body (10, 60+) is a variation of the invention (see 10, 47+).

Since Tanaka does indeed teach direct contact between the support body and the bond wires as discussed above, the rejections taught in the previous office action are upheld and are re-stated below.

***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-7 and 20-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Tanaka et al., US Patent 6,265,762.

Tanaka teaches a lead frame structure comprising:

- a semiconductor die (10) with a pad electrode (11) thereon;
- a package lead (3);
- a bond wire (13) comprising one end attached to the package lead, the other end attached to the pad electrode, and an intermediate portion; and
- a wiring support (15) positioned between the package lead and the pad electrode that is attached to the intermediate portion of the bond wire (Figure 11).

Regarding claims 2 and 21, Tanaka teaches a support jig (16), to which the wiring support (15) is attached (Figure 11).

With respect to claims 3, 7, 22 and 26, Tanaka teaches the wiring support and the support jig as being made of an insulating material (10, 36+).

As to claims 4 and 23, Tanaka teaches a supporting body (8) attached to the support jig, wherein the die is attached to the supporting body (Figure 11).

Regarding claims 5 and 24, Tanaka teaches the supporting body as being made of a metallic material having a high thermal conductivity for heat dissipation (5, 10+).

With respect to claims 6 and 25, Tanaka teaches using a sealing body (14) that encloses the die, a portion of the package lead, the bond wire, the wiring support, and the supporting body (Figure 9).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al., US Patent 6,265,762, as applied to claims 1 and 20 above.

Tanaka fails to teach the die as comprising a programmable logic device.

It would have been obvious to one ordinary skill in the art at the time of the invention to optimize the die of Tanaka to include a programmable logic device because programmable logic devices are obvious and well-known semiconductor die setups (MPEP 2144.05(b)).

Claims 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lacap, US Patent 5,905,299, in view of Tanaka et al., US Patent 6,265,762.

Lacap teaches a quad flat pack (QFP) package comprising:

an electrically insulative tape (608) [intermediate lead finger mounting substrate];

a die (606) having bond pads attached to one side of the tape;

a lead (602);

a bond wire (612) having one end attached to the bond pad of the die, the other end attached to the lead, and an intermediate portion;

a heat spreader (614) attached to the opposite side of the tape; and

a plastic molding (604) that encapsulates the die, part of the lead, the bond wire and the heat spreader (Figure 6).

Lacap fails to teach the attachment of an intermediate lead finger to an intermediate lead finger mounting substrate, wherein the intermediate lead finger is positioned between the package lead and the bond pad and attached to an intermediate portion of the bond wire, and encapsulated by the mold compound.

Tanaka teaches leadframe structure comprising a wiring support (15) attached to a support jig (8) [intermediate lead finger mounting substrate], wherein the wiring support is positioned between the lead and the bond pad and the intermediate portion of the bond wire is attached to the wiring support (Figure 11).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the wiring support of Tanaka in the invention of Lacap because Tanaka teaches that the wiring support supports and maintains a loop in the bond wire and keeps the bond wires at a fixed height thus avoiding short-circuit among mutual wires (10, 31-46).

Regarding claims 10 and 11, Lacap teaches the tape as being made of an insulating material (6, 55+); also Tanaka teaches the wiring support as being made of an insulating material (10, 36+).

With respect to claim 12, it would have been obvious to one ordinary skill in the art at the time of the invention to optimize the die of Lacap and/or Tanaka to include a programmable logic device because programmable logic devices are obvious and well-known semiconductor die alternative setups (MPEP 2144.05(b)).

As to claim 13, Lacap teaches the die as being attached to a middle portion of the tape (Figure 6) and Tanaka teaches the wiring support as being attached to a peripheral portion of the support jig (Figure 11).

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to David A. Zarneke whose telephone number is (703)-305-3926. The examiner can normally be reached on M-F 10AM-6PM.

Application/Control Number: 09/863,652  
Art Unit: 2827


Page 7

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (703)-305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-308-7722 for regular communications and (703)-308-7721 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.



David A. Zarneke  
January 27, 2003



DAVID L. TALBOTT  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800